Considerations on the Application of Information Technology Tools in Building the Accounting of Entities

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Abstract

In this paper, in a simplified manner, we try to highlight some problems that have arisen in the context of the digitization of accounting as a booming process, similar to other industries. The reasons for the lower applicability can be found in the exceptionally high regulatory requirements regarding the validity and integrity of accounting data. The whole accounting system is built so that counterfeiting is impossible or at least very expensive. To achieve this, it relies on mechanisms of mutual control, checks and balances. Most of them are manual tasks, which require a lot of work and are far from automated. Blockchain technology can be the next step for accounting: instead of keeping separate records based on transactions, companies can record their transactions directly in a common register. Because all entries are distributed and cryptographically sealed, falsifying or destroying them to hide the activity is virtually impossible.

Key words: blockchain technology, accounting, trends
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1. Introduction

Blockchain or Distributed Registry Technology (DLT) is fundamentally a technology related to the discipline of accounting. Blockchain technology has the potential to increase the speed of transaction processing in accounting, allowing the implementation of a spatially distributed accounting accounting system (www.hyperledger.org). This technology has the potential to ensure certainty on the data describing the assets and liabilities of entities, which generates the confidence of the accounting profession to be able to implement a goal hitherto considered impossible to achieve: multidimensional or multi-item accounting

There are currently technological difficulties in the legal system that need to be resolved for blockchain technology to be included on a large scale in the accounting systems applicable in different legislations. We consider that the accounting profession has the necessary capacity and theoretical and practical skills to implement blockchain in practical solutions adapted to the needs of entities. Professional accountants have the level of cognitive skills in the field of accounting, auditing, taxation, skills needed to collaborate in issuing financial reporting standards that will drive the blockchain forward in practical implementation (www.hyperledger.org).

Blockchain is a fundamental change in the way accounting records are created, maintained and updated. Instead of having a single issuer of the accounting records, the accounting records under the conditions of using blockchain technology are transmitted to all interested users. The fundamental thesis underlying the blockchain approach in accounting is the use of a well-defined system for verifying accounting records. In this way, it is ensured that, in the absence of a central owner of the accounting information and with time lags between all users, a unique version of the economic reality transposed in the accounts to the set of all users is registered. This new approach to accounting concepts generates a universally distributed accounting system, in which input data is shared unchanged, permanently to all users of accounting data. (www.hyperledger.org)

Blockchain is a solution for remote, online processing of accounting data related to the instantaneous recording of assets, liabilities, equity, financial results and cash flows. Blockchain technology is a support platform for accounting and business that must be constantly developed.

2. Theoretical background for the use of blockchain in entities's accounting

There are three key terms that explain what makes blockchain technology different from today's more popular software technologies, applications that consist of data recorded and modified by a single information administrator. The basic aspects can be summarized as follows: Blockchain is a solution for remote, online processing of accounting data related to the instantaneous recording of assets, liabilities, equity, financial results and cash flows. Blockchain technology is a support platform for accounting and business that must be constantly developed (www.hyperledger.org):

1. Data transmission: There are multiple versions - copies of a blockchain register and no master or central register. All users can view the full version of the registry and all versions are identical as recorded data. There is no user in control. We must note that this aspect must be adapted to ensure the requirement derived from the concept of heritage.

2. Permanence: Each user has his own version of the accounting register, the reality of the accounting records is established by the score between users. Historical financial transactions cannot be changed without the permission of most users, which means that blockchain accounting records are permanent. Complete accounting records are stored by each participant and data verification is ensured.

3. Programmability: Some software blockchains allow the registration of the program source code together with the data of the registry entry - automatically generated entries are created in the software log, program sequences that are executed automatically when the source code is triggered. These are the so-called smart contracts.

Whether blockchain is applicable in a particular business or industry will depend on whether these qualities are desirable alternatives to current methods. Good blockchain applications are based on the cost and timing benefits of removing core parts from the system, as well as increased security and safety from a consensus system. (www.hyperledger.org)

We appreciate that blockchain is not just another technology, it is actually a protocol - a new way to highlight transaction logging. Blockchain is a revolutionary conceptual framework due to its unique features that make it a desirable computer product for users. For example, in a set where multiple users interact, blockchain technology may eliminate the need to reconcile accounting data from other users. Distribution among all users eliminates computer processing disruptions and eliminates the cost of paying for an external audit of accounting accuracy (www.hyperledger.org).

The first two of the three key features - propagation and permanence - are basic features of the blockchain. Any software application written in the blockchain protocol must have these key qualities. Permanent records of accounting data make certain data sets unsuitable for blockchain software solutions, such as program applications that cause the storage of unencrypted personal data (www.hyperledger.org).

We consider that the implementation of blockchain solutions in the financial accounting of entities must take into account the restrictions arising from the need to ensure the confidentiality of accounting data. The involvement in this process of professional accountants, of Accountants with a solid theoretical training, with a baggage of updated notions, is, in our opinion, an engine of the development of blockchain systems in the accounting of different types of entities(www.hyperledger.org).

3. Research methodology - evolution of entities's accounting systems - empirical aspects of research

Blockchain is also known as Distributed Registry Technology (DLT) - which is probably a simple definition of blockchain technology. In the currently known and applicable accounting model, accounting records are stored in the registers, servers or cloud applications of the issuer of the annual financial statements, in the form of a set of spreadsheet files or the database of an accounting software application. The accounting officer shall enter the entry data, record it in the register files and carry

out the necessary processing to meet the information needs of the issuer. Where regulators or other users need information about accounting records, the accounting officer shall take the necessary data and provide it to the requesting Party. In general, only the accounting officer and the auditors have direct access to the entity's accounting records (www.hyperledger.org).

In the blockchain, on the other hand, records are entered and stored in a distributed or shared registry, which is generally made available to all stakeholders. In this case, the accounting officer, regulators, auditors and entities would each have an identical copy of the register at all times. Of course, each entity would have access only to the part of the register that contains its own records. Public and private keys are used to authenticate users (www.hyperledger.org).

In addition, each record entered in the blockchain is encrypted, and each entry is automatically marked by date and time. A collection of these records forms a source block, called the blockchain. A unique hash string that represents the contents of all records is updated with each new record, and the updated hash is stored in the new data block. The hash forms a unique digital signature that can be used to verify that no records have changed once entered (www.hyperledger.org).

Users of accounting information who need to ensure compliance of data with the reality of transactions and security of real-time data processing, will focus on IT solutions that include blockchain approaches and smart contracts (www.hyperledger.org).

Reducing the need to reconcile and manage disputes arising from disputes between the parties, combined with increased certainty of the correctness of the accounting of rights and obligations, will allow a greater focus on the use of accounting information in the decision-making process. An extensive range of IT processes in today's financial and management accounting can be optimized through blockchain and technologies such as data analysis or machine learning. This technology will increase the efficiency and value of accounting, data processed in accounting.

As a result of the above, the spectrum of skills represented in accounting will change. Some activities such as reconciliation and data source verification will be reduced or eliminated, while other areas such as technology, consulting and other value-added activities will be expanded.

The fundamental aspect for which accountants should move towards blockchain technology is that it offers two advantages that are crucial for the accounting profession: transparency and immutability. It is very beneficial for the integrity of an accounting firm that its records are easily accessible to authorized persons. Of course, there must be rules that govern how authorized entities can access financial records, and the blockchain uses smart contracts to comply with those rules.

Blockchain computerized accounting is considered to be the next step for the accounting industry for good reasons, blockchain has important implications for the accounting industry, which should affect all professional accountants. Efficiency and data security are important elements in the implementation of blockchain technology in present and future accounting.

4. Findings - Survey of the specific evolutions regarding the application of information technologies in the accounting of transactions in Romania

Each participant in a Distributed Registry Technology software system keeps a instance, a variant of the amount of registered transactions - history - that were stored in the registry, and by comparing the copies of other users is stored synchronously through a process of user agreement. Unlike a classical system of accounting records, there is no user with special rights to edit or delete economic and financial transactions - in fact, there is no central register at all, which is a major difference from the classical system of accounting. double entry accounting. (www.hyperledger.org)

The idea of having a database / registry that addresses all its users has been around for some time, but there have been some serious difficulties that needed to be overcome. The most important obstacle of these was the establishment of a transaction control point and the emergence of the multiplication of necessary expenses. In a large network, transactions are constantly transmitted from different points in the network, and the transmission of transaction data will take different periods of time to reach the spatially distributed points of the network. Therefore, it is difficult to have a final order of transactions, especially if two transactions try to credit the same resource, which leads to double spending and two users who do not agree with who is entitled to a given asset.

A blockchain is an "accounting register", a decentralized electronic register, distributed in copies on several computers and consisting of a list of chained blocks.

Blockchain distributed registry software is used to account for transactions, and these, once added, cannot be changed retroactively without changing subsequent blocks of information. Amplifying in a linear progression, each new block connects to the previous one like a chain (www.hyperledger.org).

In other words, distributed blockchain registry software is a specific type of database. It differs from a typical database in the way it stores information. In this sense, the distributed blockchain registry software stores data in blocks which are then chained. As more data is added, it is entered into a new block. When the block is filled with data it is linked to the previous block, which causes the data to be stored in chronological order.

The result is a robust transaction system, a growing public register of blocks (blocks) that contain information, to which data can only be added and read, but cannot be deleted or modified (www.hyperledger.org).

The use of distributed blockchain registry software eliminates the possibility of copying or cloning digital assets. Blockchain distributed registry software ensures that each unit of value is transferred only once, with no risk of double spending.

Distributed blockchain registry software is described as a set of value exchange protocols. These blockchain value exchanges can be completed faster, more securely and cheaper than traditional systems (www.hyperledger.org).

Likewise, blockchain distributed registry software looks, according to various opinions, as a reliable, transparent, intermediary-free relationship system consisting of a chain of transactions that are recorded one after the other indefinitely, in which the latter are always find out (www.hyperledger.org).

A distributed blockchain registry database is managed autonomously, using a user-to-user network and a distributed time stamp application server. These servers are managed by mass collaboration, driven by collective interests, and the security and transparency of this system lies precisely in the large number of users.

At a simplified level, the following code made in Java, is the equivalent of a more complex mining process (www.hyperledger.org). A difficulty level is set that aims to generate a number of 0s at the beginning of the hash key. This generation requires a long processing time. Different levels of difficulty can be used for testing:

```java
public int getChainSizeNew() {
   return blockList.sizeNew();
}
public Block getLatestBlockNew() {
   return blockListNew.get(blockList.size() - 1);
}
public void addBlockNew(C data) throws NoSuchAlgorithmException {
   Block previousBlockNew = getLatestBlockNew();
   Block BlockNew = new Block<>(previous Block.getIndex() + 1, data,
getLatestBlock().getHash(), chainDifficulty);
   if (isValidBlock(previousBlock, block)) {
      blockList.add(block);
   }
}
public boolean isValid BlockNew (Block lastBlock, Block newBlock) throws
NoSuchAlgorithmException {
   if (lastBlock.getIndex() != newBlock.getIndex() - 1) {
      return false;
   }
   if (!lastBlock.getHash().equals(newBlock.getPreviousHash())) {
      return false;
   }

   if (!newBlock.getHash().equals(newBlock.calculateHash())) {
```

```
    return false;
  }
  return true;
}
```

Distributed Registry Technology - Blockchain, applied so far in various branches of the financial industry, will be applied as a novelty in the food industry in Romania, providing consumers with information obtained directly from the source - from farms, on producers in the food industry and on the quality of food offered for consumption. (www.ziare.ro)

Applied in the food industry sector, blockchain technology paves the way for every company in the food production - distribution chain: farmers, processors, food stores, to transmit information at their own risk for each batch of products on the shelves of the Carrefour commercial chain. In Romania, the Blockchain Distributed Registry Technology is applied for the first time to the eggs from the Carrefour Quality Chain from the Rojiște Farm in Dolj County, according to the press release of the Carrefour Romania commercial chain. (www.ziare.ro)

Specifically, Distributed Registry Technology - Blockchain finds its applicability by using customers by scanning the QR code on the egg package and thus reaches the dedicated page, enter the batch number that is also visible on the package, finding information about: location and name the farm or the name of the farmer, veterinary information on the hens from which the eggs came, products used to feed the birds, how the birds were raised on the egg farm, the date of packaging of the eggs and other data that complete the traceability of the product. Thus, whether they are shopping in the store or receiving food by home delivery, customers can discover the #dincoloderaft story of the eggs and the farmer in the back. (www.ziare.ro)

The Carrefour Quality Chain (FCC) is a project through which the company conducts long-term joint ventures directly with national and international manufacturing companies in order to offer consumers quality products at affordable prices. In the production process, each stage of the production process is constantly supervised by experts who carefully monitor the entire production chain of growth and cultivation, until the products reach Carrefour stores (www.ziare.ro).

CryptoData is also an example in Romania. The company's goal is to provide a secure operating system, devices and communication applications. Key and blockchain component. At the software level, they developed the Voice Over Blockchain Protocol (VOBP) for security, and for storage the InterPlanetary File System (IPFS) standard is used, still in its development and adoption phases, but augmented with blockchain. Even if IPFS technology is still in its infancy, the potential is there to provide secure, decentralized storage, ie exactly what principles blockchain is based on: decentralization and transparency of operations. (www.ziare.ro)

Specific to blockchain technology is that, once the data has been entered into the system, it cannot be deleted or modified without altering the entire structure and thus the consent of the majority of participants in that blockchain. From monitoring the route of a new one to keeping records and eliminating bureaucracy is not such a big step. But it takes time, and the reasons are quite predictable. (www.ziare.ro)

In a certain form, the Special Telecommunications Service (STS) also applied blockchain in Romania in the voting process. This state-of-the-art complementary solution guarantees the integrity and strengthens the transparency and traceability of the electoral process, STS said in November 2020. (www.ziare.ro)

STS specialists have developed and implemented the modern blockchain technological solution that does not allow the modification or alteration of the data recorded during the electoral process, not even by their administrators, ensuring their integrity and transparency. Both the data from SIMPV and the data from SICPV will be able to be verified on the dedicated website, where the registered information and their details will be presented in real time. (www.ziare.ro)

Blockchain technology, used in countless industries, consists in calculating unique and unrepeatable fingerprints, which are updated every 5 seconds. A possible change in the information generates a new imprint, making the change visible. In short, blockchain technology forms a chain of trust in the flow of information in which any change is visible. (www.ziare.ro)

5. A case study of records of transactions in the accounting

On January 1, 2020, an entity purchases a building whose acquisition cost is 2,400,000 m.u. (monetary units). The building has a useful life of 30 years and will be used for rent to third parties, thus being classified in the category of real estate investments. (Nicolae, 2010).

In accordance with its accounting policies, at the end of each reporting period the entity performs tests to determine whether there are any indications of impairment of the building. As of December 31, 2020, the entity finds that an impairment has occurred and the value of the impairment adjustment is 200,000 m.u.

As of December 31, 2021, the entity notes a reduction in the adjustment for impairment by 100,000 m.u.

On December 31, 2021, the entity decides to sell the building at the price of 2,800,000 m.u.

The recording accounts used (as proposed in the IFRS accounting plan) for the exemplification of these accounting records were selected based on the formulated assumptions (Nicolae, 2010).

<u>**Accounting data**</u>
(Making entries by the author)

1. Recognition of purchase:

Debit *Real estate investments recorded at cost* 2,400,000
Credit *Suppliers of fixed assets - real estate investments* 2,400,000

2. As of December 31, 2020, the entity registers the depreciation related to the period January 1 - December 31, 2020 = 2,000,000 m.u. / 30 years = 80,000 m.u.

Debit *Operating expenses related to depreciation of fixed assets, real estate investments and biological assets valued at cost* 80,000
Credit *Depreciation of real estate investments valued at cost* 80,000

3. Recognition of Depreciation of the building on December 31, 2020:

Debit *Operating expenses on adjustments for impairment of fixed assets, real estate investments and biological assets valued at cost* 200,000
Credit *Adjustments for depreciation of constructions* 200,000

4. Recognition of the amortization of the real estate investment related to the period January 1 - December 31, 2020

Annual depreciation = 2,400,000 - 80,000 - 200,000 = 2,120,000 m.u. / 29 years = 73,103 m.u.

Debit *Operating expenses related to depreciation of fixed assets, real estate investments and biological assets valued at cost* 73,103
Credit *Depreciation of real estate investments valued at cost* 73,103

5. Recording the partial resumption of the previously recognized impairment adjustment on December 31, 2021 :

Debit *Adjustments for depreciation of constructions* 100,000
    Credit *Income from adjustments for impairment of fixed assets, real estate investments and biological assets valued at cost* 100,000

6. Recognition of the amortization of the real estate investment related to the period January 1 - December 31, 2021:

Annual depreciation = 2,120,000 - 73,103 + 100,000 = 2,146,897 m.u. / 28 years = 76,675 m.u

Debit *Operating expenses related to depreciation of fixed assets, real estate investments and biological assets valued at cost* 76,675
Credit *Depreciation of real estate investments valued at cost* 76,675

7. Registration of the sale operation:

Debit *Various debtors* 2,800,000
Credit *Income from the sale of real estate investments* 2,800,000

8. Recognition of asset disposal:

Debit *Depreciation of real estate investments valued at cost* 149,778
Debit *Adjustments for depreciation of constructions* 100,000
Debit *Expenses with the sale of real estate investments* 1,750,222
Credit *Real estate investments recorded at cost* 2,000,000

9. The financial result generated by the sale of the real estate investment :

Profit = 2,800,000 - 1,750,222 = 1,049,778 m.u

When implemented in practice, entities may also consider other accounting records alternatives as long as there is a fair presentation of the results in profit or loss and in the statement of financial position.

6. Conclusions

In my opinion, the use of information technology (IT) information capabilities through new, innovative methods provides the necessary framework for multidimensional processing of accounting information.

In this way, a permanent updated flow of accounting data is ensured to the various actors, users of the summary accounting documents. This creates the framework for a real-time interaction between the need for accounting data in the decision-making process of entities and spatially delocalized data sources.

An aspect of major importance is to ensure increased security of accounting data, in the conditions of an external environment with multiple challenges and threats from actors, competing entities or parastatals.

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